

The Automotive Industry: An Overview of In-car DAB

WDMB workshop - Brussels

December 1st 2010

Gerry Penrose Jaguar Land Rover

The Automotive Industry

Key messages



RANGE
ROVER



- Automotive needs standards
 - Complexity of development
 - Long production and in service use of product

- Importance of digital radio for cars
 - Future relevance of broadcast in cars
 - Desire for richer content



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Why we need Standards



- Complex of development
 - Multiple systems
 - Integration task
 - Adverse operating conditions
 - Significant design and verification task



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Complexity of Development

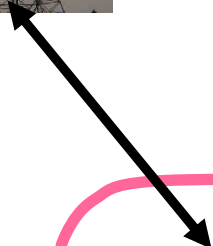


The Connected Car of the 60's
LW or MW

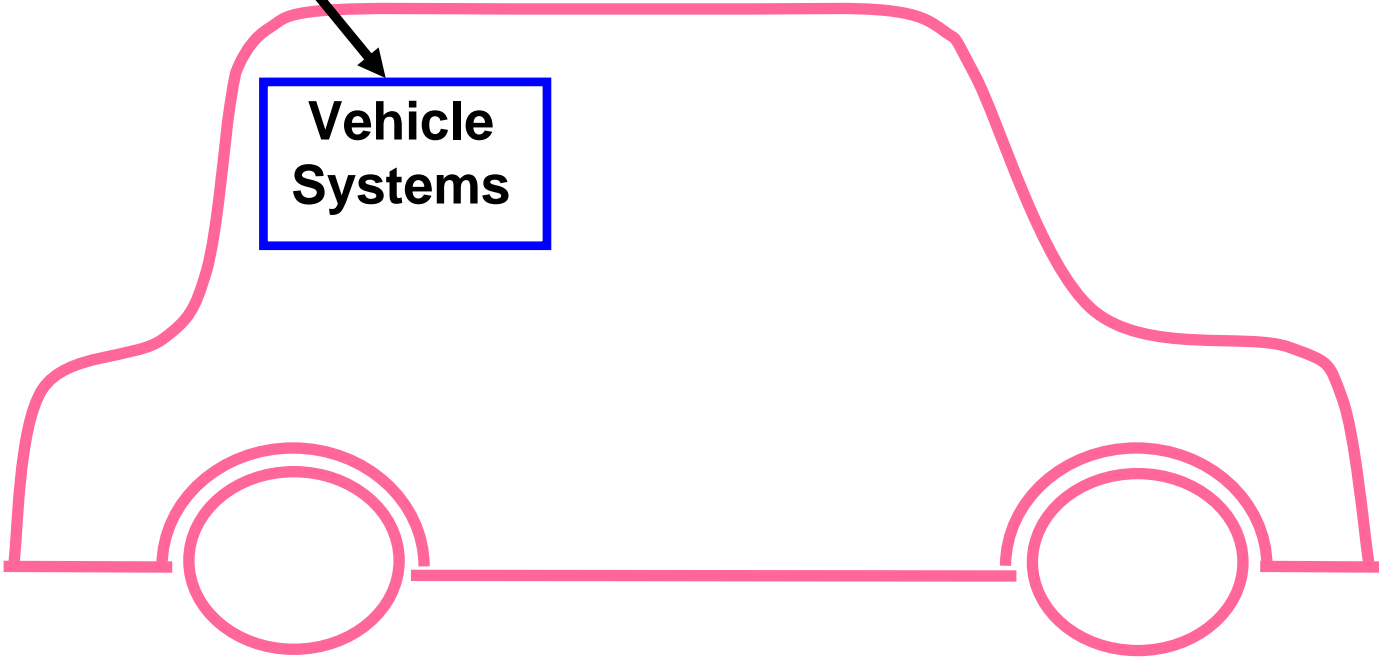


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Complexity of Development



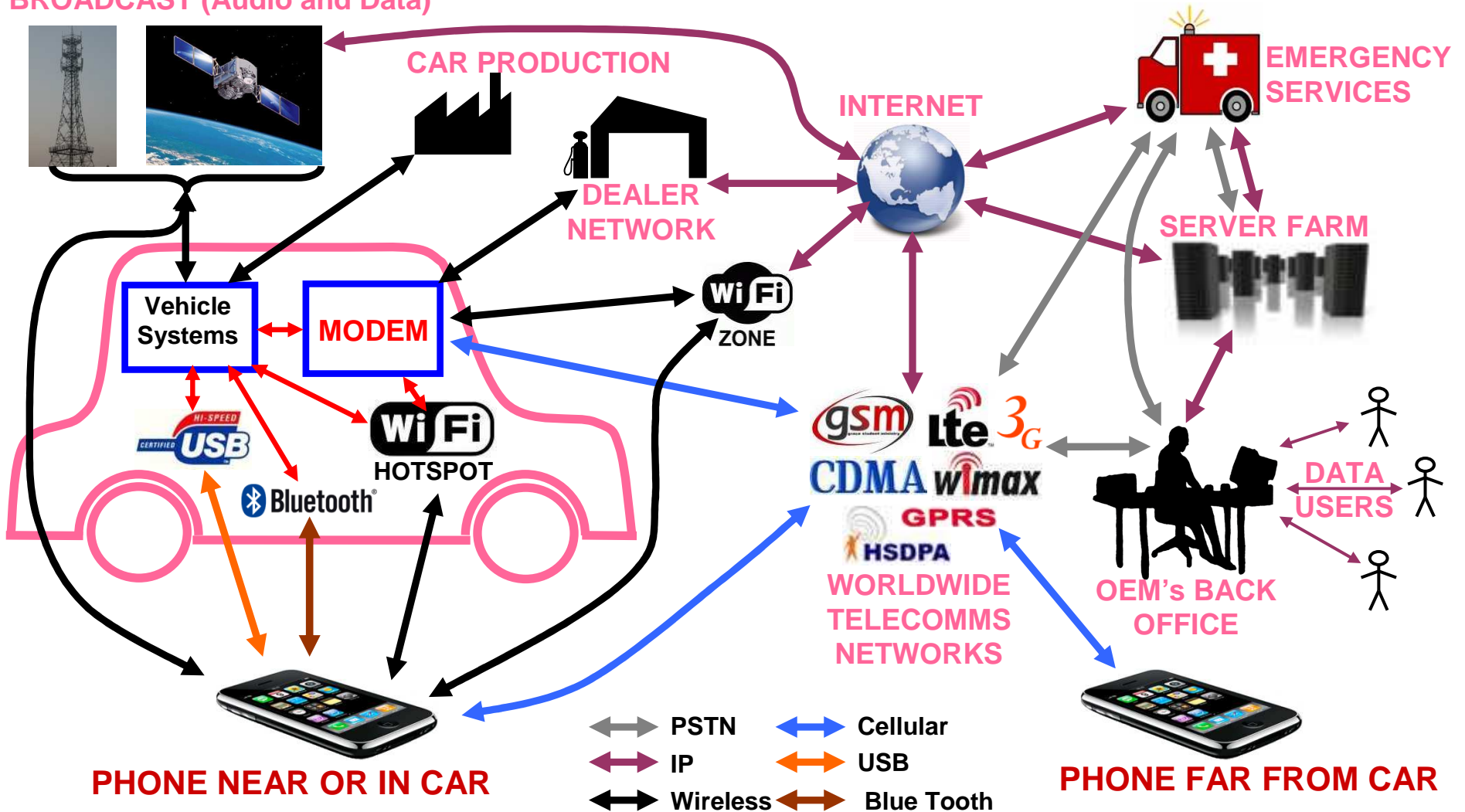
**Vehicle
Systems**



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BROADCAST (Audio and Data)

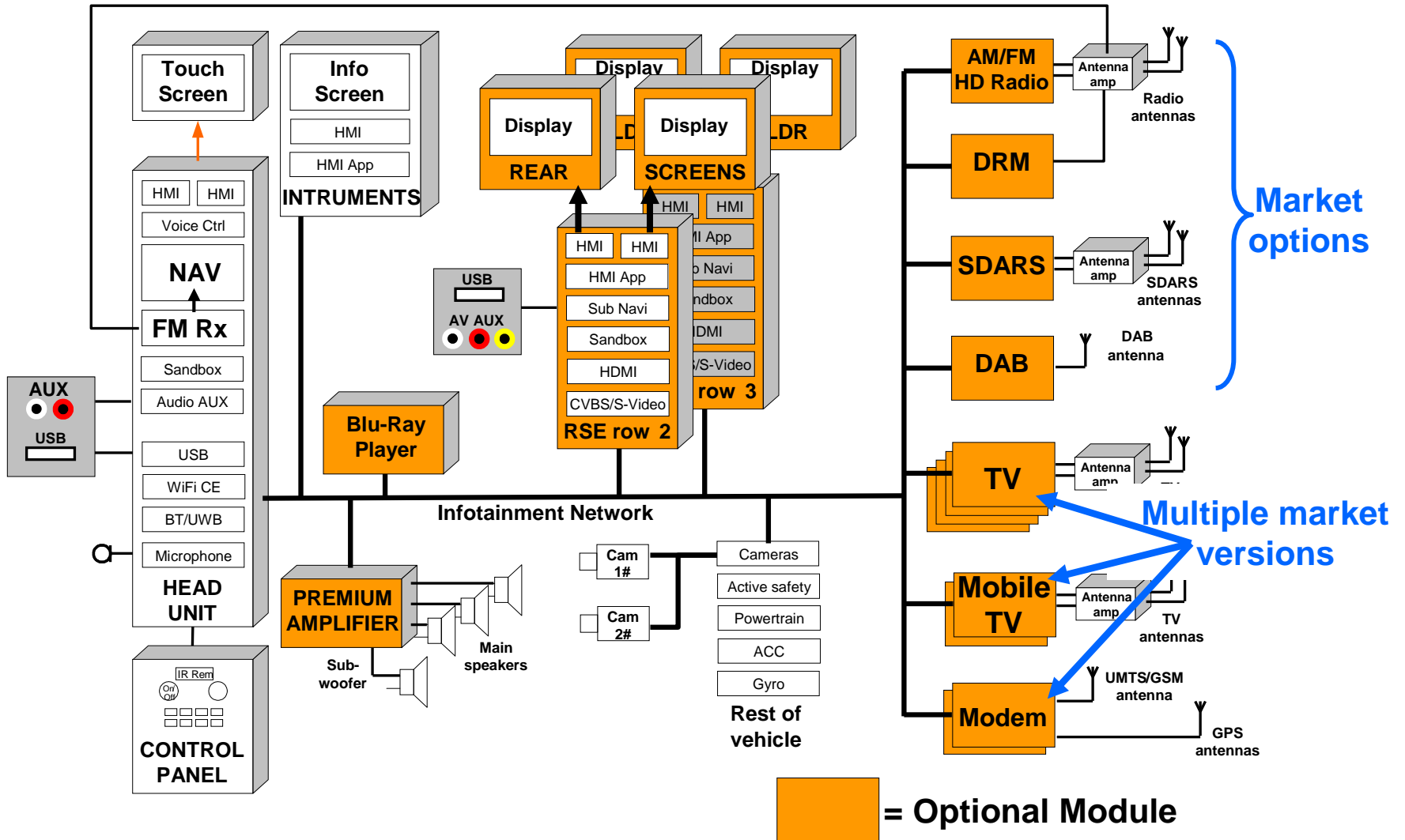


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Complexity of Development



The Automotive Industry Complexity of Development



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Complexity of Development



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- Dynamic Environment
 - Temperature -40°C to $+85^{\circ}\text{C}$
 - Operation 10 Years +
 - Crash worthiness
 - Electrical Interference (*Electromagnetic compatibility*)
- 140 Markets - some with very poor roads
- Very significant test programme both at component and vehicle level



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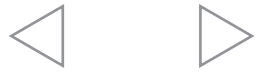
Long Life Cycle



- We need stability in standards

Development	Production	Service life more than 10 years
circa 3 yrs	circa 3 yrs	80% of Land Rovers ever built are still running

- Changes in standards will lead to cars in service having the wrong format
- We probably still have Land Rovers and Jaguars from the 60's without FM!



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Key messages



- Automotive needs standards
 - Complexity of development
 - Long production and in service use of product
 - Product moves across markets

- Importance of digital radio for cars
 - Future relevance of broadcast in cars
 - Desire for richer content

— 15 - 63 years






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Relevance of Digital Radio for Cars



Past Week Media Usage in Car
Online consumers who spend 15+ mins/typical day in their cars

	UNITED STATES 	GREAT BRITAIN 	CANADA 
Listened to broadcast radio	85%	78%	90%
Listened to CDs/cassettes	49%	62%	49%
Listened to iPods, mp3 players, smartphones through vehicle's stereo system	23%	26%	25%
Listened to Sirius/XM satellite radio	16%	n/a	15%
Streamed audio programs or podcasts on their smartphones through their vehicle's stereo system	9%	7%	2%

Source: online survey by [Vision Critical](http://www.visioncritical.com), representative sample of 4,020 online consumers in the United States, Britain and Canada, August 23 to September 6, 2010

<http://www.visioncritical.com/newsroom/radio-stilldominates-in-car-listening-but-drivers-want-online-audio-options-too/>

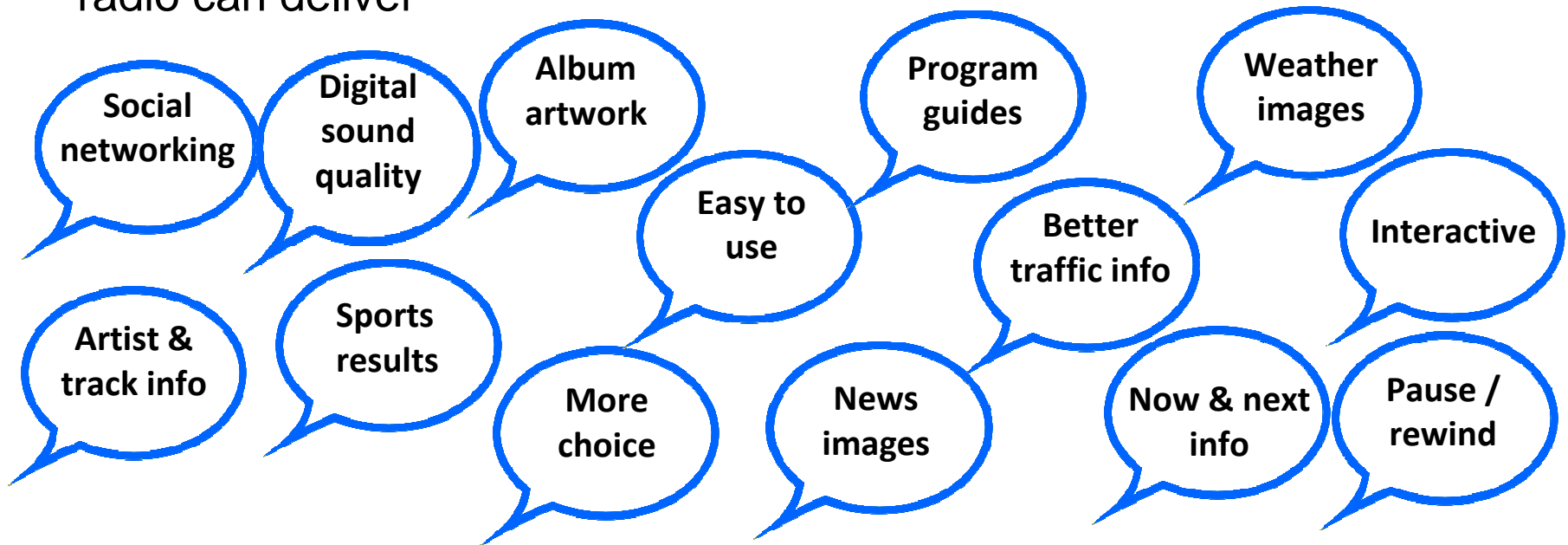


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Relevance of Digital Radio for Cars

- Growing divide between what consumers expect and what analogue radio can deliver

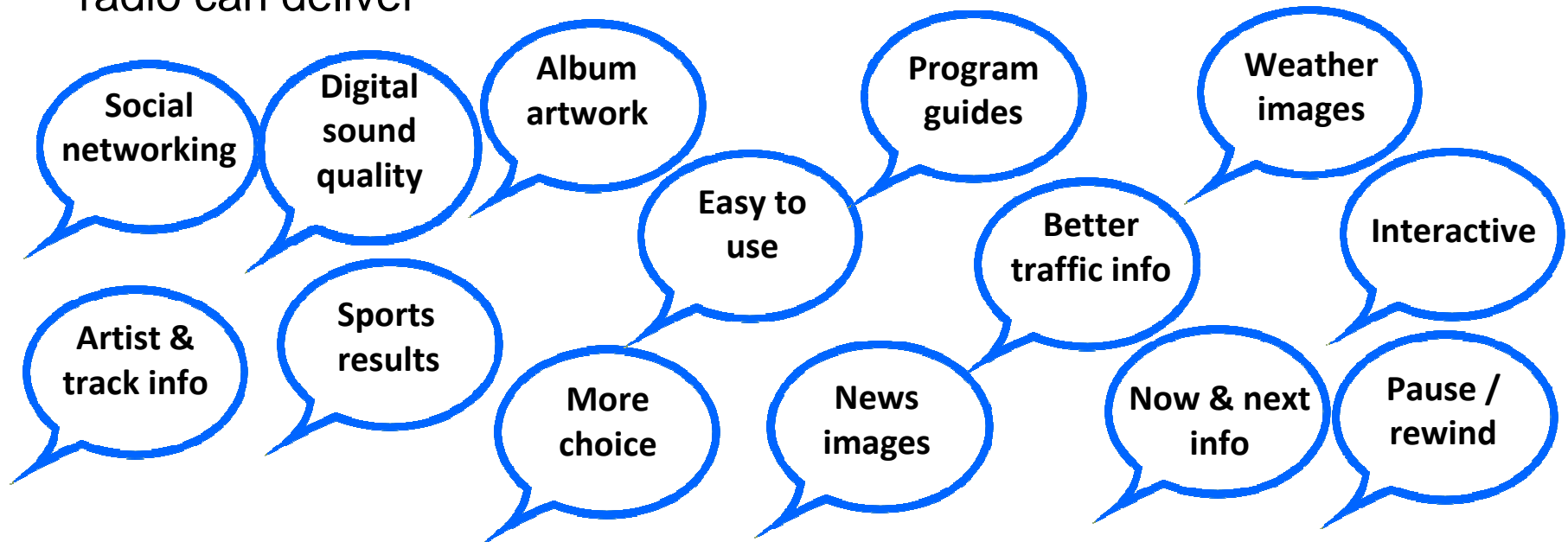


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Relevance of Digital Radio for Cars

- Growing divide between what consumers expect and what analogue radio can deliver



- If radio does not deliver expectations it will become irrelevant

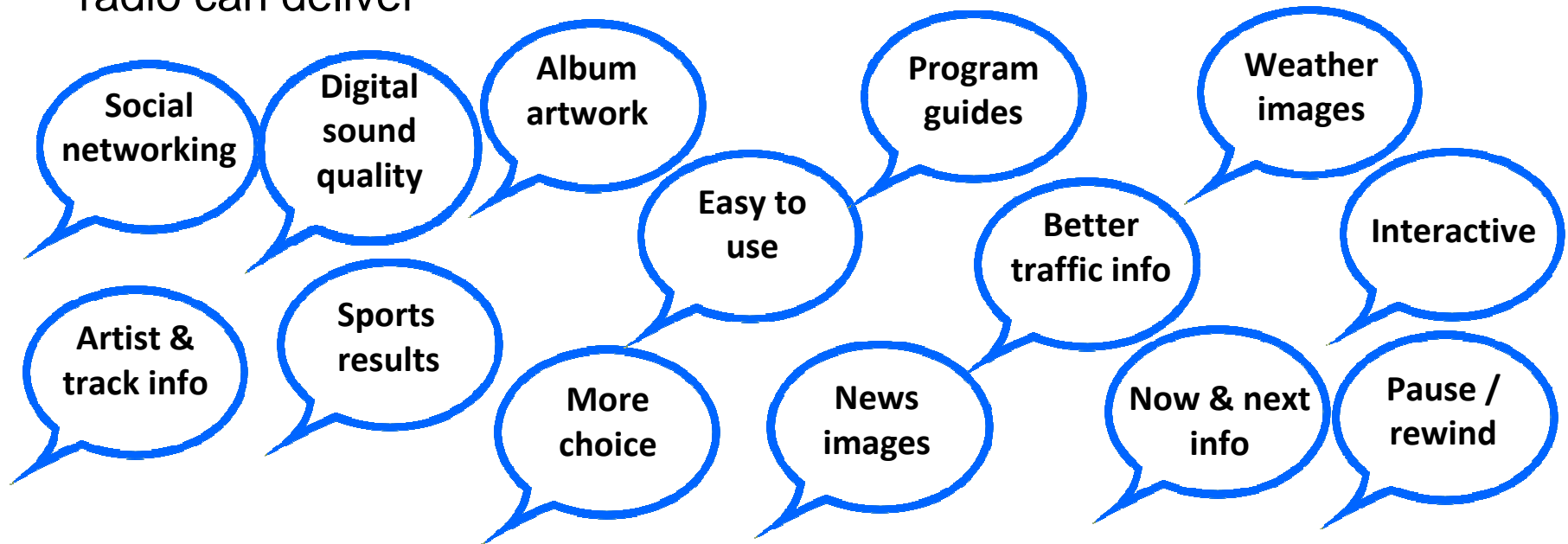


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Relevance of Digital Radio for Cars

- Growing divide between what consumers expect and what analogue radio can deliver



- If radio does not deliver expectations it will become irrelevant – it is already happening:
 - **0%** of 16-24 year olds would miss not having a radio

Source: 2009 OFCOM research in UK



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Relevance of Digital Radio for Cars

- Good radio reception
 - Maintaining common channel while travelling distances
 - Coverage – especially rural areas
 - High sound quality
- Wide entertainment choice
- Easy Human Machine Interface (HMI)
 - Artwork is good
 - Pause / rewind
- Relevant data services
 - Traffic and parking info, artist and song title, song tagging



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Relevance of Digital Radio for Cars



TERRESTRIAL



SATELLITE



Just a few examples

ONLINE



Which should we support, and when?



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Relevance of Digital Radio for Cars

- Not very mobile
 - Wi-Fi reception does not work on-the-move
 - Wi-Fi will never achieve coverage of broadcast
 - 3G bitrates reduce at speed
 - 3G networks do not have coverage level of broadcast
- Not free
 - Consumers need to pay ISP / mobile carrier
- Not cost effective
- Typical audio streaming service consumes 64 – 128Kb/s while a typical data user would consume only 2.5Kb/s
 - Within the same network bandwidth, carriers can service 50 data service users charging a low flat rate of 5 Euro (250 Euro total) V's a single streaming audio user charging a full flat rate of 30 Euro
- Capacity issues
 - Network operators concerned about widespread use of internet radio

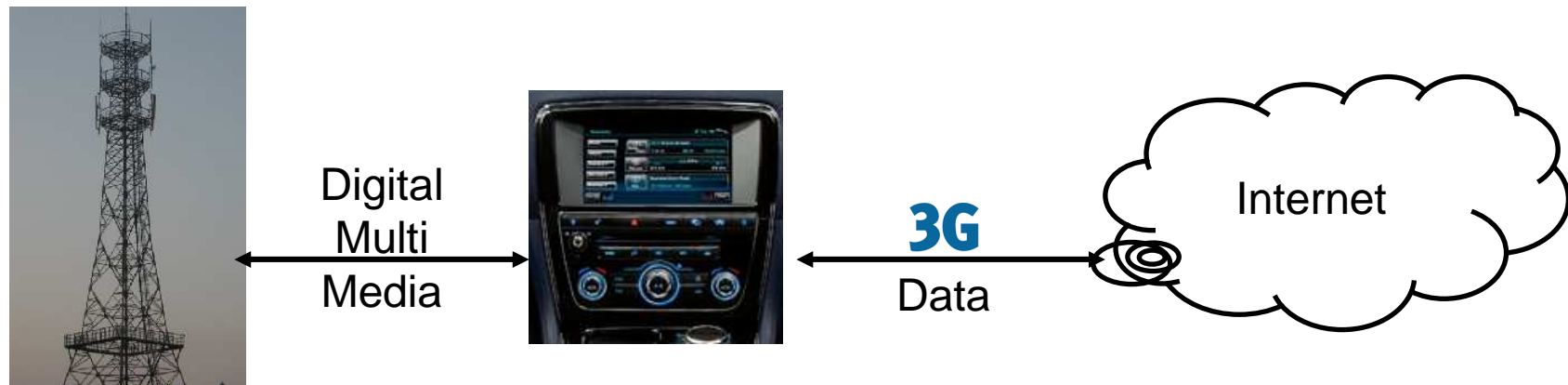


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Relevance of Digital Radio for Cars



- Hybrid makes sense and therefore a better long term bet for automotive development



Many Thanks

